COMMON

MARINE LIFE *of Lakshadweep*

A POCKET GUIDE

nature conservation foundation

The Rufford Foundation

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From the sand between your toes to that blue wall of water on the horizon, everything in the Lakshadweep owes its existence to the coral reef. A few million years ago, these waters were full of large volcanoes. As they sank, the coral reefs that surrounded them continued to grow, creating the circular atoll you see now. The older coral was ground into fine sand that collected inside the lagoon to form the Lakshadweep Islands.

Coral reefs are among the most spectacular, colourful and diverse ecosystems on the planet. They occupy less than 1% of the earth's surface but are home to 25% of all species in the sea. The reef provides food and livelihood for millions of people in the tropics and protects our coasts and islands from large waves and storms.

Today, tropical seas are getting warmer because of climate change. When temperatures rise, corals get stressed, turn completely white (or 'bleach') and die. Fish and other creatures that depend on them also die. With the reef in decline, small islands like the Lakshadweep are no longer protected from storms and cyclones, leading to land erosion and the mixing of sea water into the precious freshwater of these islands.

There is very little that people on the Lakshadweep can do about climate change. But managing our reefs well by making sure we don't overfish or pollute them can help conserve them.

This booklet is an effort to highlight some of the common marine species of the Lakshadweep, what they eat, where they live, and some curious behaviours they exhibit. We hope that this will give you a little glimpse into the world of the reef and help you understand why it is so precious to us.

Peacock grouper

Squaretail grouper

Camouflage grouper

Freckled hawkfish

Red lionfish

Bluefin trevaly

Dogtooth tuna

White-tip reef shark

PISCIVORES

Healthy coral reefs house a diversity of piscivores, or fish-eating predators. Some, like groupers, hawkfish, and lionfish are called benthic predators because they live on the reef bottom and use camouflage to hide amongst coral branches. When smaller fish and crabs wander close without seeing them, they dart out and capture them in a sudden burst of activity.

Sharks, barracudas, and trevallies are called roving predators because they live mostly in the open ocean, often visiting the reef to hunt for prey fish. They actively chase their prey over large distances, tiring them out before capturing them.

WHY ARE THEY IMPORTANT?

Top piscivores are important because they eat smaller, weaker fish, helping to keep the overall reef fish population healthy. Most predators are long-lived, and there are even some groupers that can live for up to 70 years! Unfortunately, these are also the species that are first to disappear when reefs are overfished because they are large and often easy to catch. And because they live for so long, it can take a long time for them to return to healthy numbers if they are fished unsustainably.

Did you know?

Several groupers like the peacock grouper or the back-saddled grouper start out as females and turn into males as they get older! This sex-change is called hermaphroditism and is common in several reef fish.

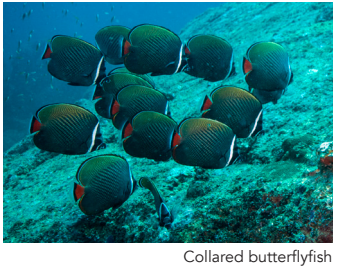
CORALLIVORES

Corallivores are fish that eat coral. Some, like the orange-spotted filefish depend almost wholly on coral for their diet – they have long, pointed mouthparts that help them suck the coral polyp – the living animal tissue of the coral - out of its skeleton. Others, like the Yellow long-nose butterflyfish may only eat coral occasionally, as part of their broader diet of algae and invertebrates.

Yellow Longnose butterflyfish

Melon butterflyfish

Moorish idol



Collared butterflyfish

Orange-spotted filefish

Chevron butterflyfish

WHY ARE THEY IMPORTANT?

Corallivores are great indicators of the health of a coral reef because they depend so much on coral for food. They are found in large numbers only on the healthiest coral reefs. If corals begin to die because of environmental disturbance, these fish show fast declines in their own numbers.

Did you know?

Collared butterflyfish are often seen in shoals of 10-15, mimicking the shape of a larger fish. They do this to trick predators into believing that they're actually one big fish, not several small ones!

HERBIVORES

Herbivores are fish like parrotfish, damselfish, rabbitfish, and surgeonfish that feed on the algae growing in a coral reef.

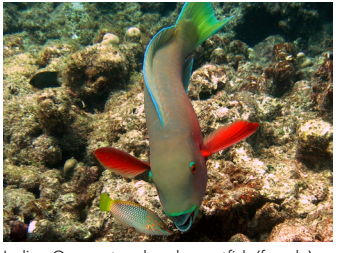
WHY ARE THEY IMPORTANT?

Herbivores are like the gardeners of a reef – they graze or scrape algae off the reef surface, keeping it finely cropped and freeing up space for new coral to grow instead. Coral and algae compete for space on coral reefs, and thus herbivores make sure that fast-growing algae do not completely take over the reef from slower-growing coral.

Did you know?

Many parrotfish like the brightly coloured Greenthroat parrotfish and the Indian Ocean Steephead parrotfish sleep in mucous cocoons that they blow around themselves at night. This keeps them safe from parasites and masks their smell from nighttime predators.

Surgeonfish like the Powder-blue tang sometimes feed in large groups, moving across the reef much like a flock of birds.



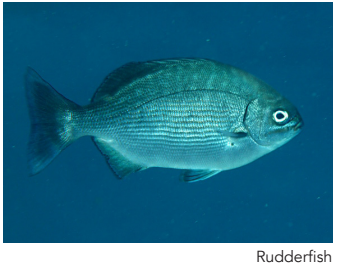
Indian-Ocean steephead parrotfish (female)

Greenthroat parrotfish

Powder-blue tang

Convict surgeonfish

Coral rabbitfish



Rudderfish

INVERTIVORES

Invertivores feed on invertebrates like shrimp, crab, urchins, worms and fish parasites.

WHY ARE THEY IMPORTANT?

Invertivores are an important link between the bottom of the food chain (plants that use sunlight to produce food) and the top (big predators). In the absence of invertivores, the numbers of invertebrates like worms and urchins would increase drastically. Too many invertebrates can be a big threat to corals because they feed on coral and may even bury themselves deep into the coral skeleton, eventually breaking and killing them.

Did you know?

Cleaner wrasses specialize in eating the invertebrate parasites off reef fish. These blue-and-black striped fish reside among certain coral boulders on the reef. These "cleaning stations", as they are called, are frequented by various reef fish, which may even form long queues to get "cleaned". Like a car wash, but for fish!

Maori wrasse

Cleaner wrasse

Doublebar goatfish

Oriental sweetlips

Bird wrasse

Longfin bannerfish

PLANKTIVORES

Planktivores eat tiny plants and animals called phyto- and zooplankton that are found near the upper surface of the ocean during the day. It is common to see triggerfish, fusiliers and unicornfish in the upper parts of the water column, for example, when one is descending during a dive.

WHY ARE THEY IMPORTANT?

Planktivores keep the water relatively clear of suspended particles, by eating the plankton in the water column, allowing maximum sunlight to pass directly down to the floor of the coral reef, where the process of photosynthesis and energy transfer takes place.

Did you know?

Unicornfish are very inquisitive fish so don't be alarmed if a few follow you on a dive!

Lyretail anthias

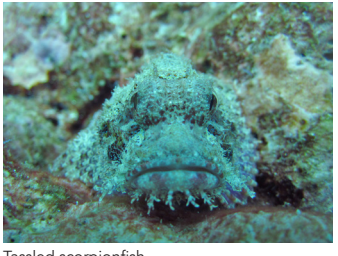
Shortnosed unicornfish

Bronze soldierfish

Bignose unicornfish

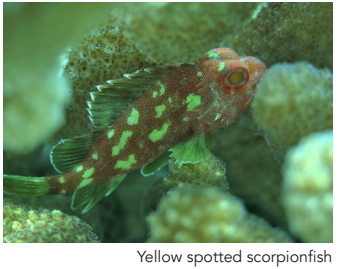
Yellowback fusiliers

Red-toothed triggerfish


Tassled scorpionfish

Clark's anemonefish

Pixy hawkfish


Yellow spotted scorpionfish

Look out for these fish!

A single colony of coral is like an apartment complex for several species that live within them. Freckled hawkfish use the branches of Acropora and Pocillopora to perch, and poisonous yellow-spotted scorpionfish are often found deep inside the colony, living in a close association with the coral. The branches of a coral colony also provide structure and habitat for the young of several species of fish, like the jewel damselfish.

Scorpionfish

Scorpionfish are the most venomous group of marine fish. They have venom glands at the base of their dorsal fin spines, which stick up and inject the venom when provoked. Scorpionfish stings can be fatal to humans. Scorpionfish are masters of camouflage and it is very difficult to spot them among coral rubble and algal mats. Be careful where you put your hand, you definitely do not want to place it on a scorpionfish.

Anemonefish

Anemonefish are also known as clownfish because of their bright orange colours. Clownfish live within sea-anemones. The tentacles of the anemone have stinging cells but anemone fish are immune to this. In return for a home to stay, clownfish keep the anemone clean from sand and parasites. Clownfish are sequential hermaphrodites, like groupers – fish are born male but turn into females later in life. They usually live in groups of all males and one female. If this female dies, then the largest male will gain weight and become the female of the group!

Pistol-shrimp and goby

Blue-streak goby

Regal angelfish

Three-spot angelfish

Gobies

Gobies are one of the most ubiquitous fish on a reef. Just like clownfish and anemones, another curious relationship is seen between the pistol shrimp and the goby. The pistol shrimp is great at building burrows but has poor eyesight, which can be dangerous in a reef full of predators. This is where the goby comes in. The goby uses the shrimp's burrow as a home, but it also acts as "eyes" for the pistol shrimp. During the day, the goby hovers above the burrow, feeding and interacting with other gobies. Meanwhile, the shrimp uses its antennae to stay in constant contact with the goby's tail while searching for food and maintaining the burrow opening. If a predatory fish approaches, the goby flicks its tail several times, alerting the shrimp to retreat into the burrow. If the predator comes within striking distance, the goby too will dart headfirst into the burrow.

Angelfish

These beautifully coloured fish are shy creatures, often retreating under rocks and boulders when followed. Angelfish are very popular fish in the aquarium trade. However, they are spongivores – eating sponges and other invertebrates. Because of the difficulty of providing this specific food in aquaria, many die because of an unsuitable diet.

Giant moray eel

Yellow margined moray eel

Giant reef stingray

Eels

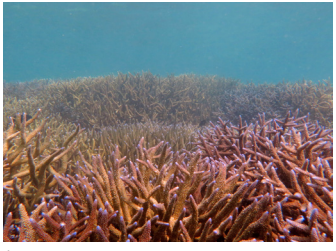
Though they look a lot like snakes, eels are actually a kind of fish. Their fins are fused together all along their body, giving them a snake-like appearance. Eels are piscivores and live within cracks and crevices in the coral reef matrix.

Some eels form a partnership with groupers - the two often hunt for fish together. The eel enters coral boulders and chases prey out of holes and crevices right into the mouth of the grouper, who waits outside. In return, the grouper warns the eel of approaching predators, because it is believed that eels have poor vision.

Rays

Rays are amongst the most graceful creatures on the reef. It is common to see them glide over the reef by flapping their triangular wings. They habit the deeper parts of reefs, and are capable of diving to depths of several hundred meters. Rays are invertivores, feeding on crustaceans and mollusks by crushing the shells with their flattened teeth.

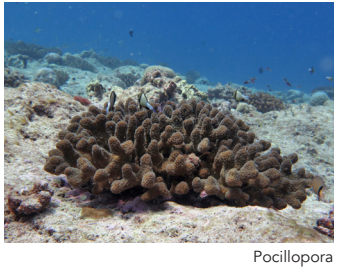
The Giant reef stingray has a large circular fin and is found along sandy floors of the lagoon and shallow reefs. It gets its notorious name because of the sharp, venomous barb on its tail. Don't get too close!



Acropora

Pavona

Platygyra



Pocillopora

Porites

Montipora

HARD CORALS

Corals are both plants and animals. Surprised? This is because of a special symbiotic relationship between algae and their coral host. Thousands of algal cells, or zooxanthellae, live inside the coral tissue and provide energy to the coral animal through photosynthesis. In return, these algae get protection from predators. The coral animal uses the energy the algae provide to grow in the incredible diversity of shapes and sizes you see on a reef.

WHY ARE THEY IMPORTANT?

Corals are the architects of reefs. Growing over thousands of years, they have given the reef ecosystem its structure, shape, and form, creating a maze of shelters and refuges for the thousands of fish and invertebrates that reside in and among them. They are also the lungs of the reef, trapping energy from sunlight (through the process of photosynthesis) and transferring that energy to an entire food-chain: from the smallest crab to the largest reef shark. Without corals there would be no coral reef.

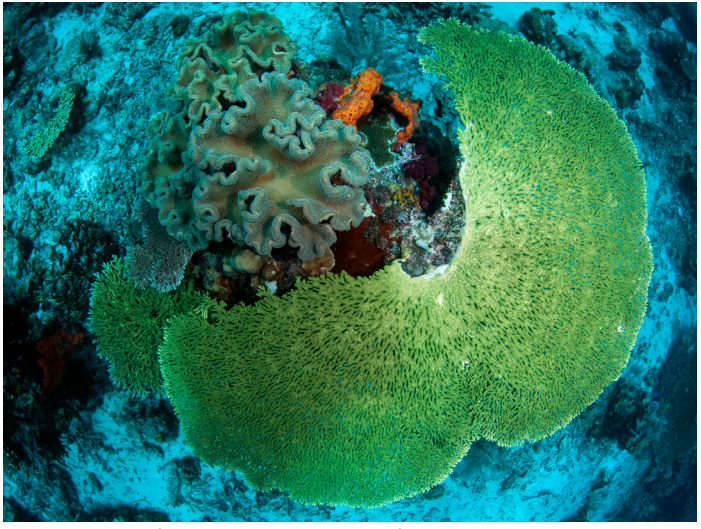
Did you know?

Because zooxanthellae are differently coloured, corals too pick up a unique hue depending on the type of algae inside them. When the water gets very warm (over 30°), they get stressed and expel the algae from their tissues. They also lose their colour during this process, "bleaching" a dull white. Bleached coral are a direct indicator of environmental stress on the reef.

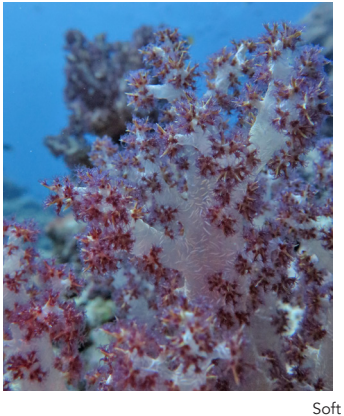
SOFT CORALS

Soft corals do not produce calcium carbonate skeletons, unlike stony corals like Acropora and Pocillopora that do. Soft corals are able to live in nutrient-rich waters with low light conditions. They are often found in the deeper parts of reefs. Even though they also have algae inside them that produce food for them, they readily eat any food that is floating in the water. Several species of fish, crabs, and snails, live inside the folds of soft coral.

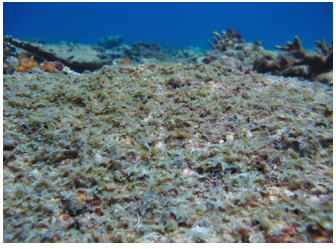
Soft corals come in many hues – reds, purples, blues, and browns. They grow in many shapes too – branched, fingered, lobed. Soft corals are also a popular item for aquaria as they are easy to transport and grow well in captivity.



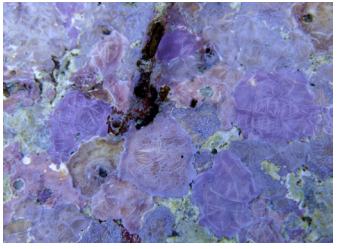
Soft coral surrounded by a colony of apple green Acropora



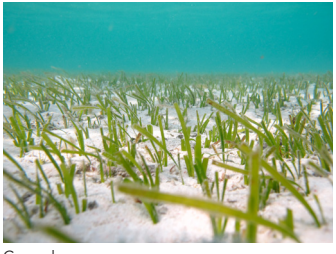
Soft corals



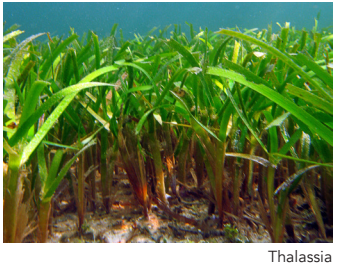
Turf algae



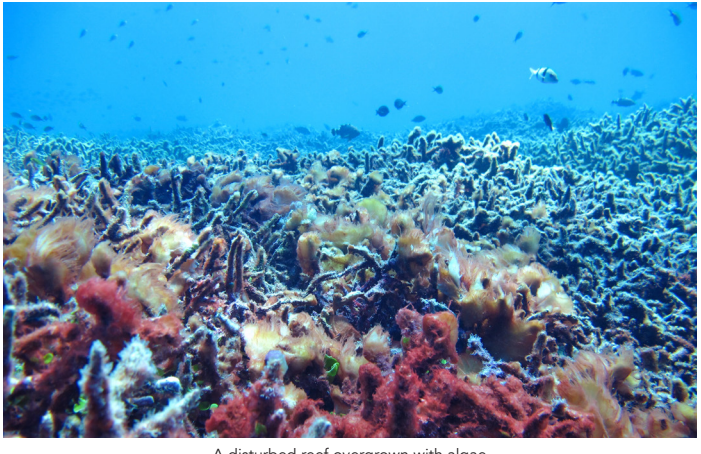
Crustose Coralline algae (CCA)



Cymodocea



Thalassia



A disturbed reef overgrown with algae

ALGAE & SEAGRASS

TURF ALGAE

Turf algae is a closely cropped but often dense layer of algae that grows on reef surfaces. In a healthy reef, turf is kept short and grazed on by herbivores. When kept in check, it is a critical component of the coral reef ecosystem even though it is sometimes invisible. If it overgrows, it can outcompete corals for light and space and grow into dense strands that even fish begin to find unpalatable.

CRUSTOSE CORRALINE ALGAE (CCA)

CCA are a type of calcareous algae that grow on the reef. These algae are bubblegum pink, or a bright fluorescent green, or a deep red. They are important for a healthy reef. They make very good habitat for young coral because they do not compete with them as they grow. Because they also secrete calcium carbonate, they help cement together the rubble and dead coral in a disturbed environment, helping to stabilize a lot of crumbling structure. This has led some scientists to refer to coral reefs as “coralgal reefs”.

CYMODOCEA AND THALASSIA are seagrasses, which form extensive meadows in shallow lagoons. They control erosion by cementing sand together among their roots, so not all of it washes up ashore. Seagrasses are also an important source of food for herbivores like surgeonfish and sea turtles. Seagrass meadows act like crèches for young reef fish, providing a safe habitat during their early years. These fish migrate to the deep coral reef when they get bigger.

Acropora crab

Pocillopora crab

Hermit crab

Christmas-tree worms

Crown-of-thorns starfish

A crown-of-thorns starfish preying on a coral

OTHER REEF CREATURES

CRABS

Hermit crabs – so called because they spend their lives inside the discarded shells of snails, like a hermit who lives alone – are often found on sandy reefs, and on the beach. Hermit crabs have to keep changing shells as they grow, and will often try on several shells before they choose the one that fits them best. If you stare at a shell long enough and it begins to move – there's probably a hermit crab under it!

Trapezid crabs live inside coral colonies, most commonly of Acropora and Pocillopora corals. They eat the mucous secreted by the coral and in turn protect the coral by keeping away coral-eating fish.

CHRISTMAS TREE WORMS

The outer surfaces of coral may also have several other organisms growing on them, like christmas tree worms. These organisms filter the water current for food and are very sensitive to movement – snap your fingers in front of one and it'll retreat into its hole before you can blink!

CROWN-OF-THORNS STARFISH

These are large and brightly coloured starfish that prey on hard corals. They get their name from the venomous spines that cover the upper surface of their body. This notorious coral-eater has few predators of its own and when their numbers increase, they can wipe out an entire coral reef by eating up corals.

Octopus

Nudibranch

Nudibranch

Nudibranch

Hawksbill turtle

Green turtle

OCTOPUSES

Octopuses are commonly found in the Lakshadweep, especially in the lagoons on the western sides of islands. Octopuses live for only a few years, dying soon after they reproduce. They are hard to spot because of their amazing ability to camouflage into their surroundings. But it's easy to spot their dens – usually enclosures at the base of coral boulders or crevices, decorated on the outside with a sprinkling of shells and small stones.

NUDIBRANCHS

Nudibranchs are soft-bodied, slug like creatures, which belong to a group of organisms called mollusks. While most mollusks like snails have an external skeleton, nudibranchs shed theirs when they are tiny larvae – which explains the 'nude' in the term nudibranch! Nudibranchs come in many beautiful, bright colours. These colours warn predators that they are highly poisonous.

TURTLES

Sea turtles are marine reptiles, which means that they cannot breathe underwater. It is therefore common to spot them coming up for air – a speck on the horizon might just be a turtle! Sea turtles migrate long distances and use the coral reef habitat to find food and take shelter. During the nesting season, females come to the beach to lay eggs. The young ones that hatch from these eggs will one day find their way back to the same beach to lay their own eggs. Coastal construction and development therefore greatly threaten turtle nesting habitats worldwide.

Sea cucumber

Suction pads around the mouth of a sea cucumber

SEA CUCUMBERS

Sea cucumbers are found on the sea floors of lagoons and reefs in the Lakshadweep. As their name suggests, they look very much like cucumbers, but are coloured a leathery brown or black. Sea cucumbers have finger-like suction pads around their mouth that they use to capture prey on the reef bottom. They are very important for the recycling of nutrients in marine ecosystems, but are often harvested in large numbers for human consumption and medical use.

Field notes